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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/816,170	04/02/2004	Heine Melle Mulder	081468-0309024	7878
909	7590	11/29/2005	EXAMINER	
PILLSBURY WINTHROP SHAW PITTMAN, LLP			GUTIERREZ, KEVIN C	
P.O. BOX 10500			ART UNIT	
MCLEAN, VA 22102			PAPER NUMBER	
			2851	

DATE MAILED: 11/29/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/816,170	Applicant(s) MULDER ET AL.	
	Examiner Kevin Gutierrez	Art Unit 2851	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 October 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-11 and 13-16 is/are rejected.
- 7) ☒ Claim(s) 12 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 02 April 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|----------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>9-26-05</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Arguments

1. Applicant's arguments, see Remarks, filed October 27, 2005, with respect to the specification, drawings (Figures 4 and 5) and claims have been fully considered and are persuasive. The objection to the specification and drawings (figures 4 and 5) and rejection to the claims has been withdrawn.

Regarding Applicant's remarks (page 6, 4th paragraph), a replacement drawing of figure 2a has not been received. The drawings fail to provide an illustration with the claimed optical element in a pupil plane. Therefore, the objections to the drawings stated in the previous office action remain pertinent.

Drawings

2. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the

a. Page 3, claim 1 - "...reflective integrator having a rectangular cross-section..."

b. Page 3, claim 1 - "...intensity distribution is asymmetric with respect to at least one of the X and Y axes."

c. Page 13, paragraph 54 - optical element 50

d. Figure 2a, claim 4 - said optical element in a pupil plane

must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by

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the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 1-4, 13-14 and 16 rejected under 35 U.S.C. 102(e) as being anticipated by Shinoda (US 2003/0151730).

Regarding claims 1 and 13, Shinoda discloses

- “a reflective integrator (4) disposed along an optical axis of the lithographic apparatus, the reflective integrator having a rectangular cross-section perpendicular to said optical axis, the cross-section having sides parallel to mutually perpendicular X and Y axes ([0046], 3-5, where the shape may be of a four sided figure; and

- an optical element (20), constructed and arranged to redistribute an intensity distribution exiting the reflective integrator such that the intensity distribution is asymmetric with respect to at least one of the X and Y axes ([0019], last sentence; [0063], lines 6-8).”

Regarding claims 2-3 and 14, Shinoda discloses “wherein said optical element is constructed and arranged to rotate an intensity distribution of a beam of radiation around said optical axis over an angle between 5 and 85 degrees ([0082], lines 2-5).”

Regarding claim 4, Shinoda discloses “wherein said optical element (20) is disposed downstream of said reflective integrator (4) in a pupil plane of said illumination system ([0077]).”

Regarding claim 16, Shinoda discloses all of the claimed limitations and further discloses

- “an illumination system ([0041], last line) for providing a projection beam of radiation;
- a support structure ([0054], line 1) for supporting a patterning device (13; mask), the patterning device serving to impart the projection beam with a pattern of its cross-section ([0040], lines 8-9);
- a substrate table ([0057], line 4) for holding a substrate (15; plate);
- a projection system (14) for projecting the patterned beam onto a target portion of the substrate ([0055], lines 1-3);

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 5 and 7-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shinoda in view of Nakagawa et al (5,859,707).

Regarding claims 5 7 and 9-10, Shinoda discloses an optical element where it comprises of a glass plate, with an applied film, including plural members to control the light transmittance ([0017], lines 14-16). Shinoda does not disclose (claim 5 and 9-10) wherein said optical element includes a plurality of pairs of reflective surfaces and (claim 7) “where reflective surfaces are coated mirrors.”

However, having “wherein said optical element includes at least two pairs of reflective surfaces” and “wherein reflective surfaces are coated mirrors” is known to the art as it is evident by the teaching of Nakagawa et al (col. 41, lines 51-54, where Nakagawa et al teaches a cold mirror comprising of a glass plate with a film for reflectance and transmittance light). Thus, it would have been obvious to one ordinary skilled in the art at the time the invention was made to modify the optical element of Shinoda by having a glass plate have a film for reflectance and transmittance for at least the purpose to use a beam of measurement.

Regarding claim 8, Shinoda as modified disclose “wherein said at least one pair of reflective surfaces are planar and parallel to each other so that a direction of a ray of said beam of radiation upstream of said optical element equals a direction of said ray downstream of said optical element (the optical element 20 of Shinoda as modified by Nakagawa, comprising of reflective surfaces that are planar and parallel with the incident beam and transmitted beam traveling in the same direction).”

7. Claim 11 is are rejected under 35 U.S.C. 103(a) as being unpatentable over Shinoda in view of Nakagawa et al, as applied to claims 5 and 7-10, and in further view of Wynne Willson et al (6,102,554).

Regarding claim 11, Shinoda as modified discloses all of the claimed limitations except “wherein said plurality of pairs of reflective surfaces includes radially extending and tilted mirror blades, the mirror blades including a reflective coating at both sides.”

However, having “said plurality of pairs of reflective surfaces includes radially extending and tilted mirror blades, the mirror blades including a reflective coating at both sides” is known to the art as it is evident by the teaching of Wynne Willson et al (col. 4, lines 40-43); claim 24, where the blades are substantially positioned in the same plane and have reflective surfaces). Thus, it would have been obvious to one ordinary skilled in the art at the time the invention was made to further modify the optical element of Shinoda as modified by including mirror blades with reflective coatings for at least the purpose of utilizing the reflected beams as a distance measurement.

Claim Rejections - 35 USC § 112

8. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

9. Claims 6 and 15 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 6 is a limitation of a distance between the optical axis and intensity distribution, but it is rendered indefinite because of the lack of reference utilizing “upstream” or “downstream” of said optical element.

Claim 15 is a limitation of a specific angle, but it is indefinite because the claim references an angle between 5 and 85 degrees (claim 14), but then states the

angle is variable. Furthermore, it is indefinite to know what specific limitation of the optical element is being set to the value of said angle.

Allowable Subject Matter

10. Claim 12 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

11. The following is an examiner's statement of reasons for allowance: the prior art does not disclose or teach nor render obviousness "wherein a thickness of said mirror blades varies as a function of distance from the optical axis and as a function of angle around the optical axis" in combination with the rest of the claimed limitations.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

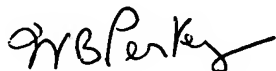
12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Sano et al (5,121,160) discloses an optical integrator utilized in an illumination optical system.

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13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin Gutierrez whose telephone number is (571)-272-5922. The examiner can normally be reached on Monday-Friday: 7:30 a.m. - 4:30 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Judy Nguyen can be reached on (571)-272-2258. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Kevin Gutierrez
Examiner
Art Unit 2851

William Perkey
Primary Examiner

November 23, 2005